IN THE CLAIMS

1-19. canceled.

20. (new) A stretching apparatus for stretching an optical fiber base material gripped by a pair of gripping devices at both ends thereof to have a desired diameter by controlling a gripping device moving device to pull the optical fiber base material, while moving a heating device relative to the optical fiber base material by controlling a heating device moving device, the apparatus comprising:

an outer diameter measuring device for measuring an outer diameter of the optical fiber base material at each position in the longitudinal direction of the optical fiber base material; and

arithmetic and control unit which performs an arithmetic operation to determine a relative speed of the heating device and a moving speed of at least one of the gripping devices, and controls the heating device moving device and the gripping device moving device in accordance with measurement results by the outer diameter measuring device;

wherein the heating device includes a heat burner, and the heat burner is disposed at a position distant by 0 to 50mm in a direction in which the heat burner is moved from a position at which the outer diameter of the optical fiber base material starts changing due to heat application by the heat burner.

21. (new) The stretching apparatus according to claim 20, wherein the arithmetic and control unit performs an arithmetic and control with a target moving speed at a heated position of the optical fiber base material being set to the relative moving speed

of the heating device relative to the optical fiber base material, and when the relative moving speed is Vb(x), Vb(x) is changed in accordance with expression (1):

$$Vb \cdot [D_{max}/D(x)]^2 \leq Vb(x) \leq Vb \cdot [D_{max}/D(x)]^3 \quad (1)$$

where Vb represents a reference speed, D_{max} represents a maximum outer diameter of the optical fiber base material, D(x) represents an outer diameter of the optical fiber base material at the heated position x, and Vb(x) represents the relative moving speed of the heating device relative to the optical fiber base material at the heated position x.

22. (new) The stretching apparatus according to claim 21, wherein the arithmetic and control unit also computes a pulling speed of the optical fiber on the basis of the outer diameter at each position in the longitudinal direction of the optical fiber base material, and the gripping device moving device moves one or both of the pair of the gripping devices on the basis of computation results.

23. (new) The stretching apparatus according to claim 22, wherein the pulling speed of the optical fiber base material is set within a range satisfying the following expression (2):

$$0.5 \leq (Dt/D_{max})^2 \leq 0.99 \quad (2)$$

where Dt is a target stretched outer diameter, and D_{max} is the same as the meaning defined in the expression (1).

24. (new) The stretching apparatus according to claim 21, wherein, in a case where the both of the pair of the gripping devices are pulled, the gripping devices at the both ends in the longitudinal direction are moved by the gripping device moving

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device at different speeds so that the optical fiber base material is pulled in a first direction parallel to the longitudinal direction.

25. (new) The stretching apparatus according to claim 20, wherein a combustion gas used in the heating device is oxygen, and a flammable gas is hydrogen or propane.

26. (new) The stretching apparatus according to claim 24, wherein the heating device moving device moves the heating device in a second direction opposite to the first direction.